



Jim Ryan



VERMONT DEPARTMENT OF  
ENVIRONMENTAL CONSERVATION  
**WATERSHED**  
MANAGEMENT DIVISION  
STORMWATER PROGRAM

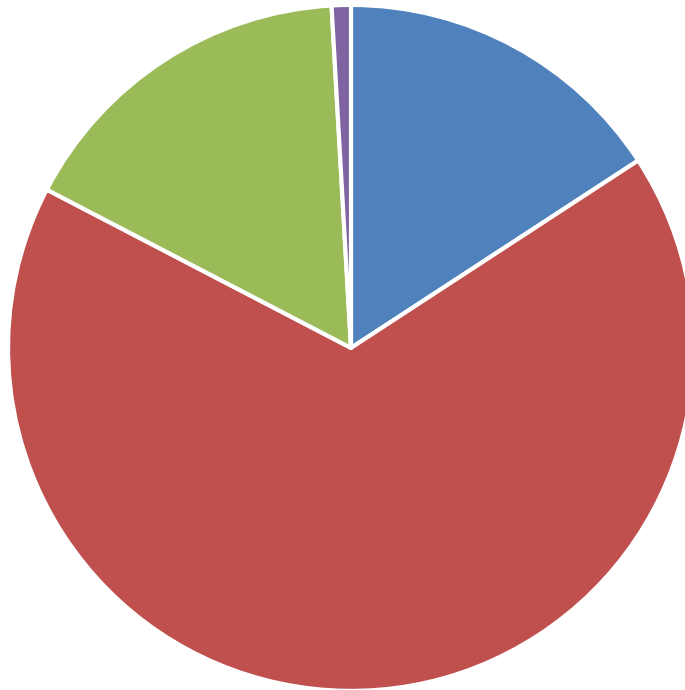
# DEC's Municipal Roads General Permit

# Today's Presentation

- Roads and water quality
- MRGP Timelines and coverage
- Hydrologic connectivity
- Road Erosion Inventories
- Very High Priority roads and prioritization
- Implementation Table and Annual Reporting
- MRGP Standards
- MRGP Fees
- Available assistance and summary for municipalities

# Vermont Road Mileage

Road Miles



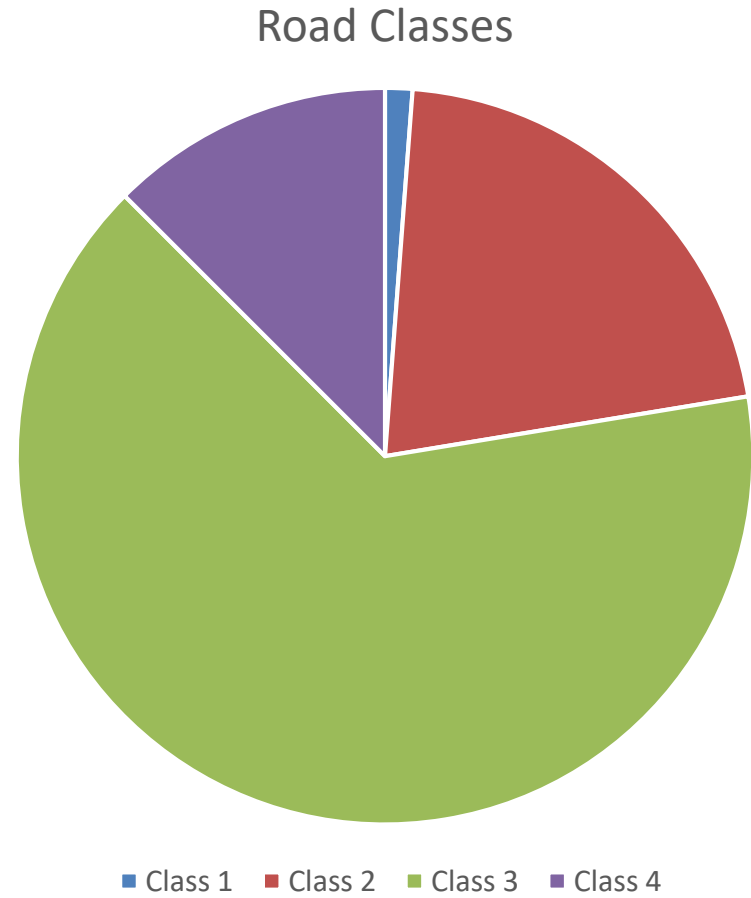
■ State Highway ■ Municipal roads  
■ Private roads ■ Federal roads

- 18,777 total road miles
- 155 miles of federal roads- 1%
- 2,709 miles of state highway- 14%
- 2,823 miles of private roads- 15%
- 13,090 miles of town highway (Classes 1-4)- 70%

# Municipal Road Classes

## Road Class Distribution (annually reported to Vtrans)

- Class 1: 139 miles or 1.1%  
(VTrans and municipally- maintained)
- Class 2: 2,790 miles or 21.2%
- Class 3: 8,535 miles or 65.2%
- Class 4: 1,627 miles or 12.5%



# Potential Road Pollutants

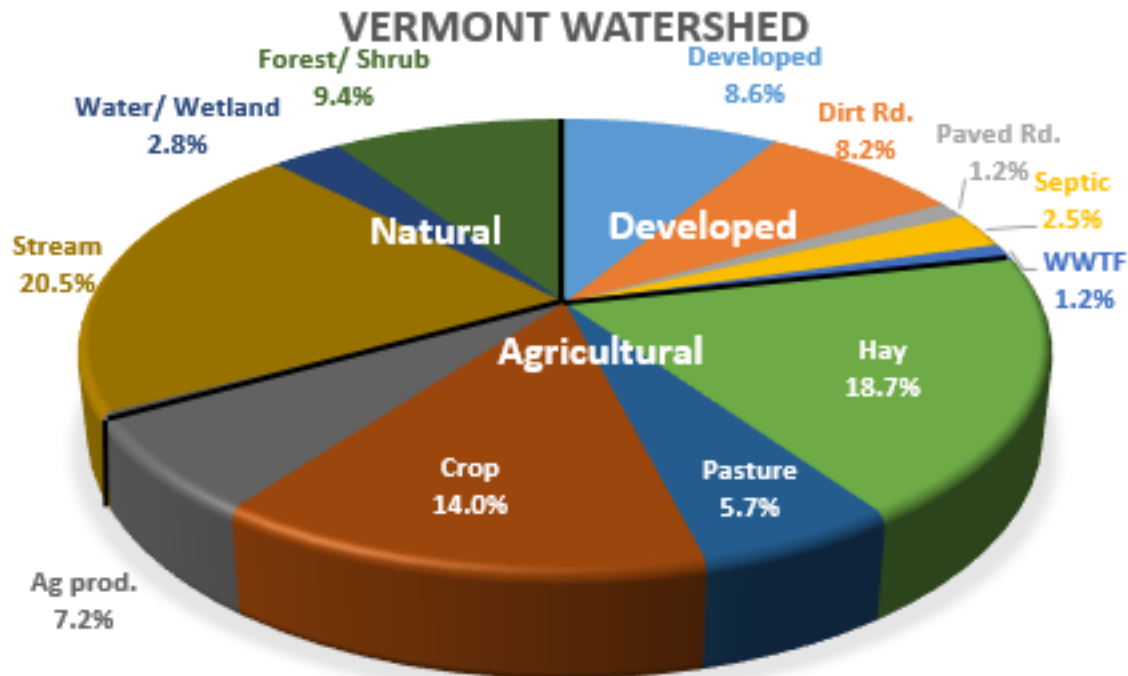
- Nutrients – Phosphorus
- Sediment
- Trace heavy metals
- Hydrocarbons
- Road salt





# Modeled phosphorus loading to Lake Memphremagog

(Municipal roads approximately 6.6% of total P)



# Secondary benefits: Flood resilience and reducing town road maintenance and costs



Photo Credits: Beverley Wemple

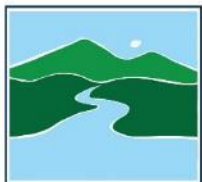
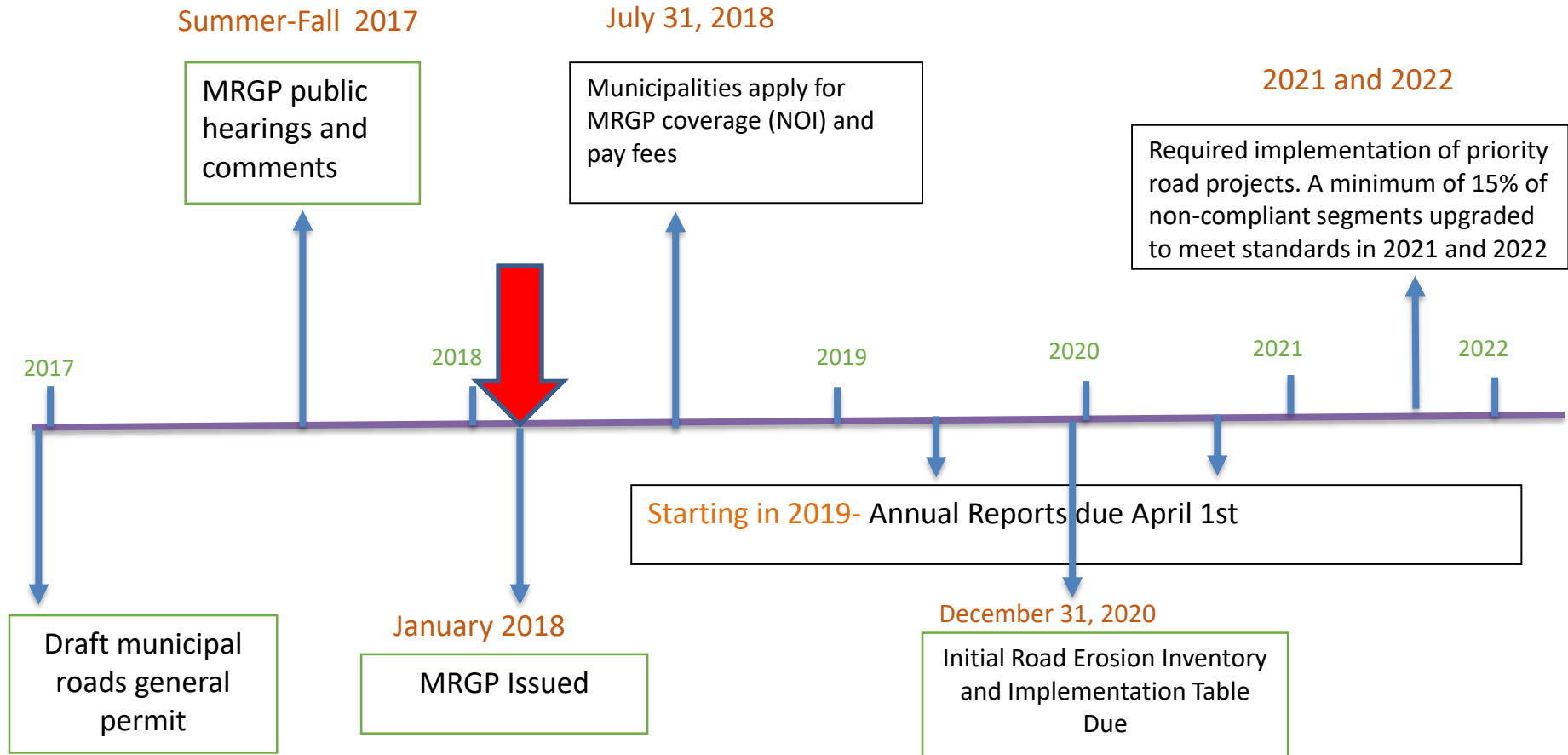


Wemple



Bryan Pfeiffer

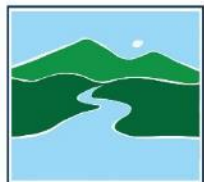
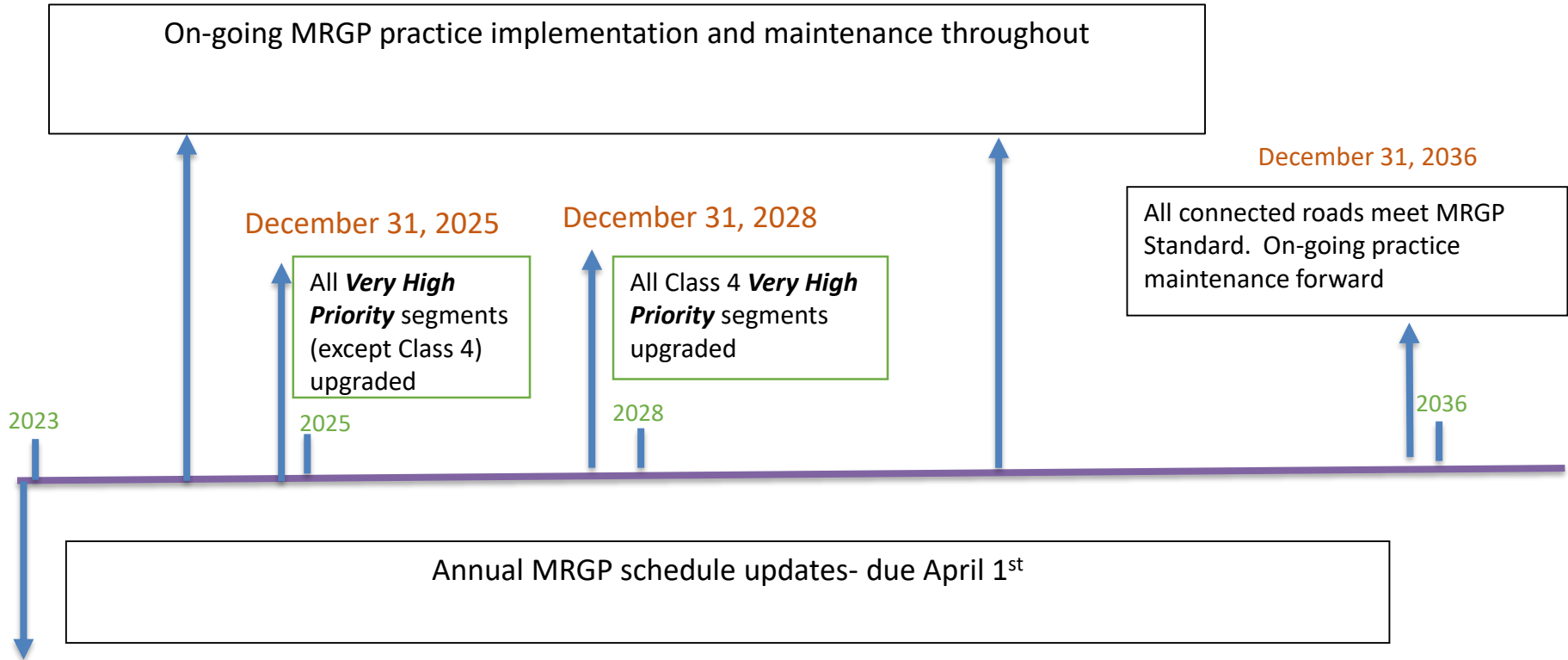
# MRGP Timeline of Deliverables (Near-Term)



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STORMWATER PROGRAM



# MRGP Timeline of Deliverables (Longer-Term)



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# MRGP Coverage

Discharges of Stormwater (SW) from municipal roads including:

- Town highways, Classes 1-4
- SW infrastructure associated with town highways under the operational control of the municipality

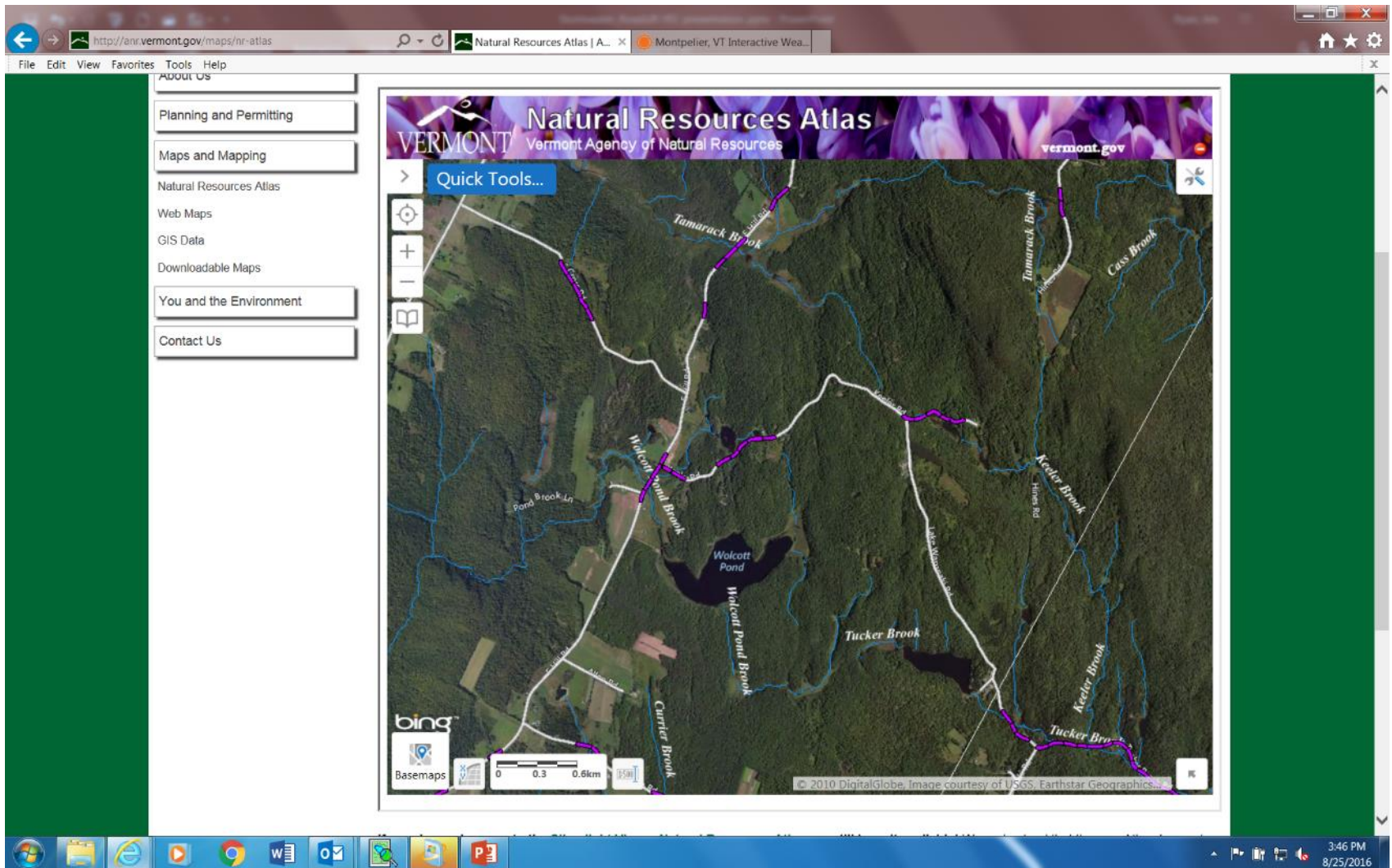
Exemptions:

- **Unorganized towns and gores exempt** from MRGP permit
- **MS4 towns-** exempt from MRGP fee and permit application but MRGP standards implementation will be required in future SW Management Plans

# What is not covered by the MRGP

- Perennial stream crossing replacements or retrofits
- Road embankment streambank or lakeshore stabilization-related to stream or wave erosion
- Standard implementation considered infeasible if the implementation of that practice will trigger another state or federal permit (except non-reporting permits such as ACOE Self-Verified)

# Hydrologically-Connected Road Segments





# Hydrologically-Connected Roads

## Connected Criteria:

- Municipal roads within 100' of a water resource
- Municipal road that bisects (crosses) and drains to a water resource
- Municipal road located within the DEC river corridor
- Segments can be re-classified as connected, or not connected, during the inventories
- Catch basin outfalls within 500' of a water resource and those segments associated with those outfalls

## Water Resources:

- Perennial streams
- Intermittent streams
- Wetlands
- Lakes and Ponds

# Road Stormwater Management Plan Components



Inventory



Prioritize – Implementation Table

Segment ID	TH Number	Road Name	Change in Connection	Road Type	Segment Slope %	Date of Assessment	Assessor	Organization	Assessment Reason	Assessment Reason Notes	Roadway Crown/Travel Lane	Roadway Crown/Travel Lane Erosion	Grader Berm /Window Assessment	Grader Berm /Window Erosion	Road Drainage Assessment	Rt Rt
1	VT-001			Gravel-ditched	6	5/13/2017	John Snow		Initial Assessment		Fully Meets	Bill	Fully Meets	Bill	Partially Meets	Bill
2	VT-002			Gravel-ditched	10	5/13/2017	John Snow		Initial Assessment		Partially Meets	None	Partially Meets	None	Fully Meets	No
3	VT-003			Gravel-ditched	11	5/13/2017	John Snow		Re Assessment	Storm Damage	Down Not Meets	Gully	Does Not Meet	Gully	Down Not Meets	Gi
4	VT-004			Class 4	5	5/13/2017	John Snow		Re Assessment	Storm Damage						
5	VT-005			Class 4	9	5/13/2017	John Snow		Work Done	Rock lined Ditches						
6	VT-006			Gravel-ditched	4	5/13/2017	John Snow		Work Done	Rock lined Ditches					Partially Meets	No
7	VT-007			Gravel-ditched	12	5/13/2017	John Snow		Work Done	Rock lined Ditches					Partially Meets	No
8	VT-008			Paved-ditched	12	5/13/2017	John Snow		Work Done	Rock lined Ditches					Partially Meets	No
9	VT-009			Paved-ditched	12	5/13/2017	John Snow		Work Done	Rock lined Ditches					Partially Meets	No

Implement



**Road Inventory and Evaluation Form A**  
**PAVED ROADS WITH OPEN DITCHES**  
**GRAVEL/OPEN (DITCHED) NON-CLASS 4 ROADS**

1 road segment = 100 meters = 328 feet  
 Both sides of road = 200 meters = 656 feet  
 Sheet Flow <1" erosion depth  
 Rill 1"-11" erosion depth  
 Gully 12"+ erosion depth

Name:

Date:

Road Segment Name, Town Highway Number & Segment ID Number:	ANR Atlas Slope:	Field Determined Slope:	Road Type:
			<input type="checkbox"/> Paved <input type="checkbox"/> Gravel

<b>1. ROADWAY CROWN/TRAVEL LANE:</b> (N/A for Paved) What percentage of the segment is properly crowned ( $\frac{1}{4}$ " to $\frac{1}{2}$ " per foot), in-sloped, or out-sloped? Note if erosion is present due to poor road surface material.			<b>Erosion Type Present</b> <input type="checkbox"/> Rill <input type="checkbox"/> Gully
<input type="checkbox"/> 0%-49% (0' - 163') Does Not Meet	<input type="checkbox"/> 50%-89% (164' - 294') Partially Meets	<input type="checkbox"/> 90%-100% (295' - 328') Fully Meets	
<b>2. GRADER BERM/WINDROW:</b> What percentage of the segment ( <b>both sides of road, 200m, 656'</b> ) is the grader berm/windrow removed? (N/A for paved roads)			<b>Erosion Type Present</b> <input type="checkbox"/> Rill <input type="checkbox"/> Gully
<input type="checkbox"/> 0%-49% (0' - 327') Does Not Meet	<input type="checkbox"/> 50%-89% (328' - 589') Partially Meets	<input type="checkbox"/> 90%-100% (590' - 656') Fully Meets	
<b>3. ROAD DRAINAGE:</b> What percentage of the segment ( <b>both sides of road, 200m, 656'</b> ) is the allowed to shed in a distributed manner to a vegetated or forested filter area (shoulder lower than travel lane) <u>or</u> drainage ditch stabilized appropriately for the slope range below?			<b>Erosion Type Present</b> <input type="checkbox"/> Rill <input type="checkbox"/> Gully
<ul style="list-style-type: none"> <li>&lt;5% slope: stabilized with vegetation, stone-lined, or check dams</li> <li><math>\geq 5\%</math> to &lt;8% slope: stabilized with stone-lined ditch or combination of grass lined ditch with check dams or grass-lined ditch if installed with disconnection practices such as turnouts and cross culverts</li> <li><math>\geq 8\%</math> slope: stone-lined ditch required</li> </ul>			
<input type="checkbox"/> 0%-49% (0' - 327') Does Not Meet	<input type="checkbox"/> 50%-89% (328' - 589') Partially Meets	<input type="checkbox"/> 90%-100% (590' - 656') Fully Meets	<input type="checkbox"/> Rill <input type="checkbox"/> Gully
<b>4. CONVEYANCE AREA/TURNOUT:</b> Do drainage outlets/conveyance areas meet the standard of being turned out, shed in a distributed manner down the bank (shedding water), and/or stabilized with vegetation (<5% slope) or stone ( $\geq 5\%$ slope)?			<b>Erosion Type Present</b> <input type="checkbox"/> Rill <input type="checkbox"/> Gully
<input type="checkbox"/> One or more areas does not meet standard.			
<input type="checkbox"/> All areas meet standard.			<input type="checkbox"/> Rill <input type="checkbox"/> Gully

**5. & 6. DRIVEWAY & DRAINAGE CULVERTS**

A. Type of culvert?	B. Is erosion present?	C. Where in the culvert cross section is erosion present and is it rill or gully erosion? SEE CULVERT CROSS SECTION DIAGRAM		
		C1. Failing header/end treatment?	C2. Outlet scour or perched culvert?	C3. Undersized/missing structure/poor condition?
<input type="checkbox"/> Driveway <input type="checkbox"/> Drainage	<input type="checkbox"/> No (Fully Meets) <input type="checkbox"/> Yes (complete C)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)
<input type="checkbox"/> Driveway <input type="checkbox"/> Drainage	<input type="checkbox"/> No (Fully Meets) <input type="checkbox"/> Yes (complete C)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)
<input type="checkbox"/> Driveway <input type="checkbox"/> Drainage	<input type="checkbox"/> No (Fully Meets) <input type="checkbox"/> Yes (complete C)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)
<input type="checkbox"/> Driveway <input type="checkbox"/> Drainage	<input type="checkbox"/> No (Fully Meets) <input type="checkbox"/> Yes (complete C)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)	<input type="checkbox"/> Rill (Partially Meets) <input type="checkbox"/> Gully (Does Not Meet)

**(Optional) IS OTHER RILL OR GULLY EROSION PRESENT?**

**Check if Present in Segment and Note Linear Feet (LF)**

☐ River-road embankment erosion

☐ Historic stone walls, LF: \_\_\_\_\_

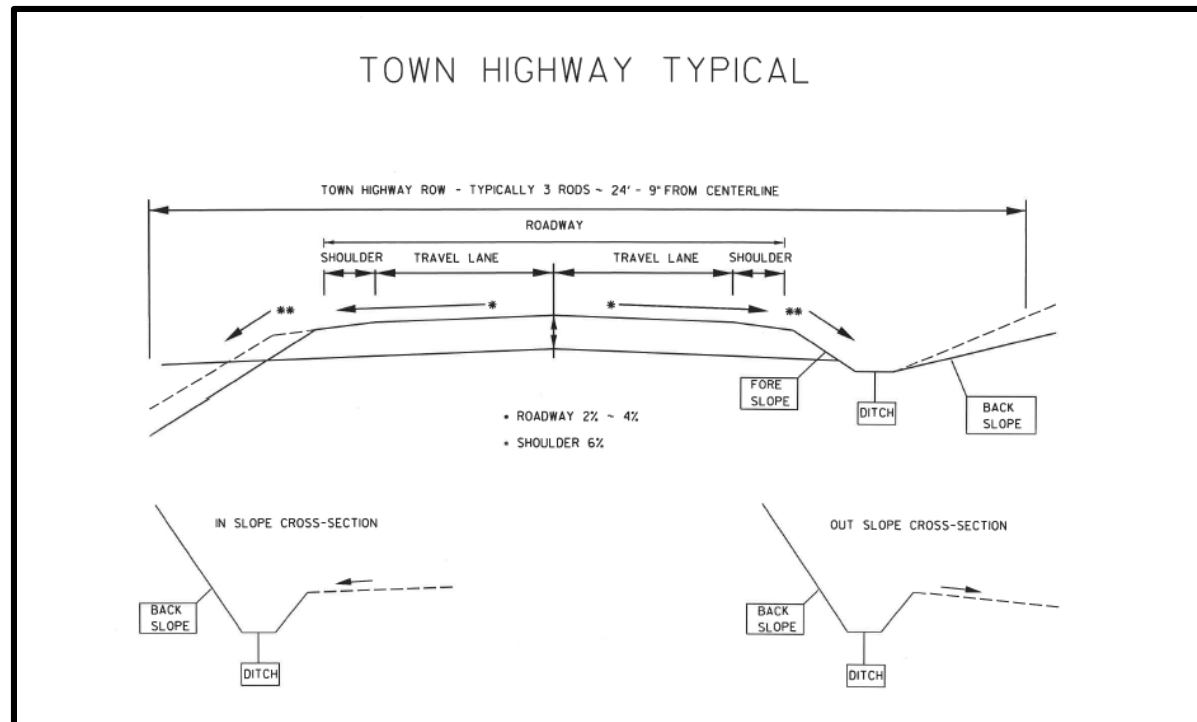


Screenshot Added

A screenshot was added to your Dropbox.

# Road Erosion Inventories (REI)

Determine if MRGP standards are met by evaluating individual practices within the road cross section.





# Road Erosion Inventories (REIs)

Separate REIs and standards for:

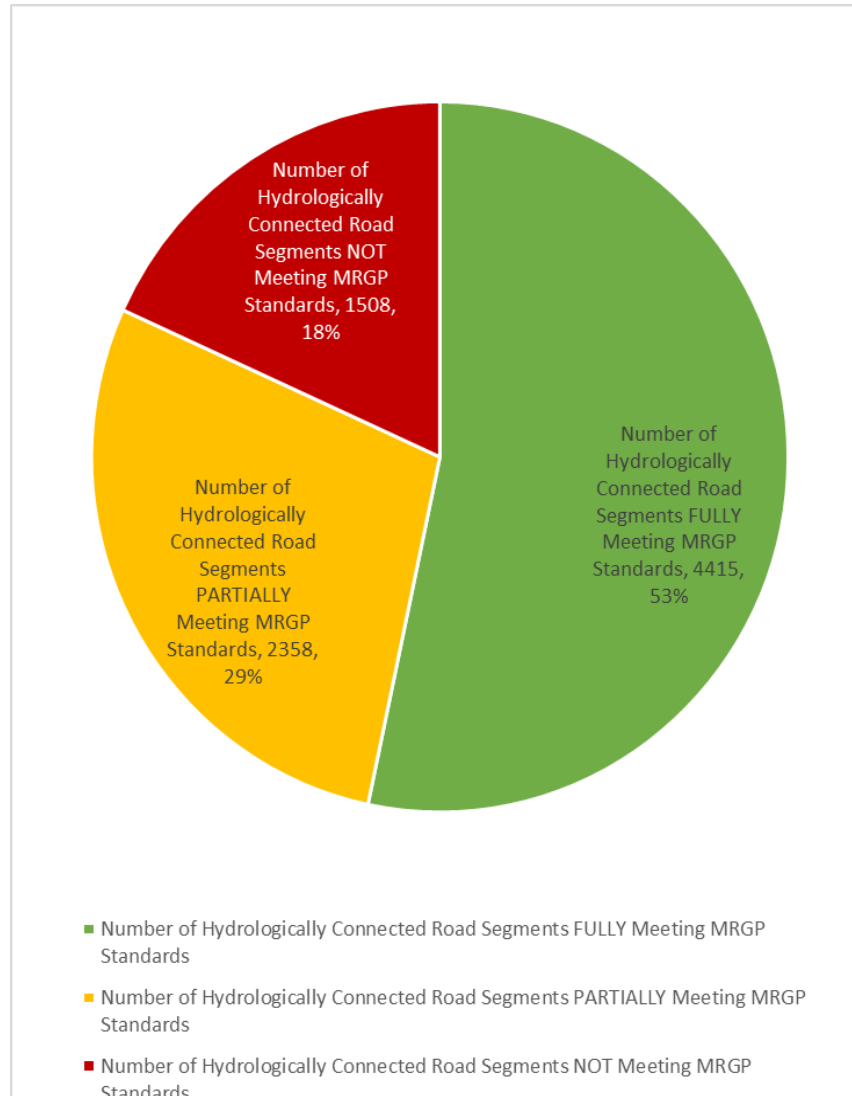
- Paved and gravel roads with ditches
- Paved roads with catch basins
- Class 4 roads

REI “scores” for each 328 foot segment:

- *Fully Meets*
- *Partially Meets* or
- *Does Not Meet*



# Approximately half of connected roads already meet the MRGP Standards



# Implementation Prioritization

- Towns will submit REI results and Implementation Tables by 12/31/2020
- All “connected” roads brought up to MRGP standards no later than 12/31/2036



# Very High Priority (VHP) Segments Criteria

## Gravel and Paved Roads with Drainage Ditches:

- *Does Not Meet* MRGP on slopes >10%

## Paved Roads with Catch Basins:

- *Does Not Meet* with outfall erosion of 3 cubic yards or more

cubic yards= (length x width x depth)/27

## Class 4 Roads:

- *Does Not Meet* MRGP (gully erosion) on slopes >10%





# Very High Priority Segments Implementation Schedule

## **VHP Paved and Gravel Roads with Ditches:**

- Shall meet standards by 12/31/2025

## **VHP Class 4 roads:**

- Shall meet standards by 12/31/2028

## **VHP Paved Roads with Catch Basins:**

- Shall meet standard by 12/31/2025



(Gully erosion)

# Implementation Table

File

Home

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Page Layout

Formulas

Data

Review

View

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Styles

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	Segment ID	TH Number	Road Name	Change in Connectivity	Road Type	Segment Slope %	Date of Assessment	Assessor	Organization	Assessment Reason	Assessment Reason Notes	Roadway Crown/Travel Lane	Roadway Crown/Travel Lane Erosion	Grader Berm /Windrow Assessment	Grader Berm /Windrow Erosion	Road Drainage Assessment	Road Drainage Erosion
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Road Segements

Outfall

List Values

Sheet1

# Implementation Table Components

- Road Erosion Inventory (REI) results
- Connected segments *Fully Meeting, Partially Meeting, and Not Meeting* MRGP Standards-report any segment status changes
- Lists all segments upgraded to meet MRGP Standards in previous calendar year

# MRGP Implementation Example

**Town A. has 52 total road miles** (VT average)

- 26 road miles are **hydrologically-connected** road segments
- 26 miles not considered **connected** (no BMP work needed)
- 13 **connected** road miles currently fully meet MRGP standards (maintenance of BMPs only)
- 13 remaining **connected** miles – required to be brought up to MRGP Standards before 2036
- 15% of 13 miles = 1.95 miles or 31.2 segments will be brought up to standards over a 2 year period 2021 and 2022



# Annual Reports due April 1<sup>st</sup> – starting in 2019

- Documentation of segment upgrades during the previous calendar year
- Changes to segment compliance status



# MRGP Principles

**First** – Disconnect road  
Stormwater whenever  
possible, starting at the top  
of the road watershed

**Second** – Infiltrate  
stormwater

**Third** – Stabilize  
conveyances and turn out  
ditches



# Implementation “Triggers”

**Required baseline standards- no matter what existing conditions are:**

- Road grading/crowning
- Grass and stone-lined ditching (based on slope) or distributed flow
- Removal of grader berm
- Lowering of shoulders
- Stable turnouts

**Practices are required when moderate (rill) to severe (gully) erosion present and for new construction:**

- 18” drainage culvert minimum- (Culvert sizing information for intermittent streams available)
- 15” drive culvert
- Culvert headwalls/headers
- Culvert outlet stabilization
- Class 4 roads- gully erosion present
- Catch basin outfall erosion

# Types of Erosion

Rill erosion 1" to <12" deep



Gully erosion 12" plus





**Seed and mulch or stone stabilization required for any work  
on connected roads within 5 days of disturbance  
(starting this field season)**

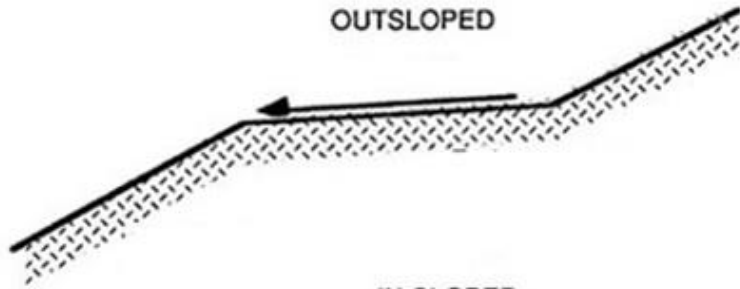




# Required Baseline Standard

Road crowning

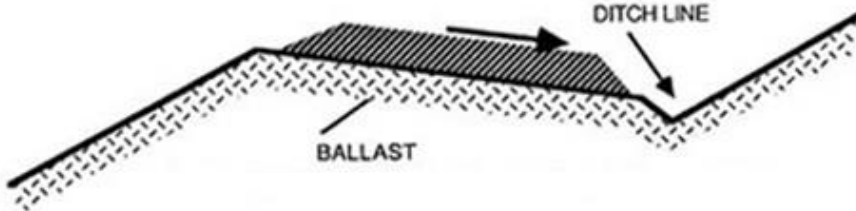
OUTSLOPED



IN SLOPED

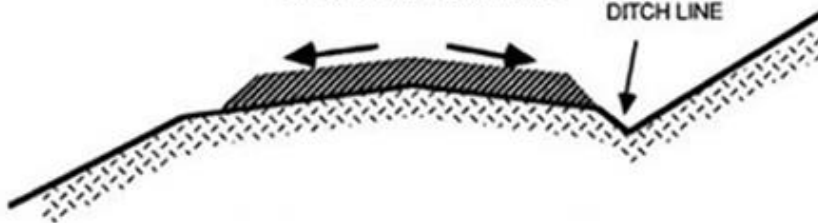
DITCH LINE

BALLAST

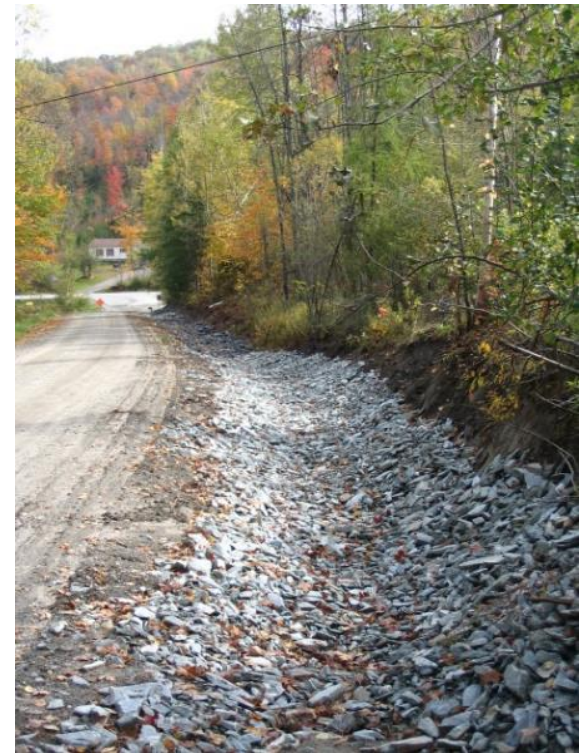


CROWNED SURFACE

DITCH LINE



# Required Baseline Standard – Grass and stone-lined drainage ditches/distributed flow

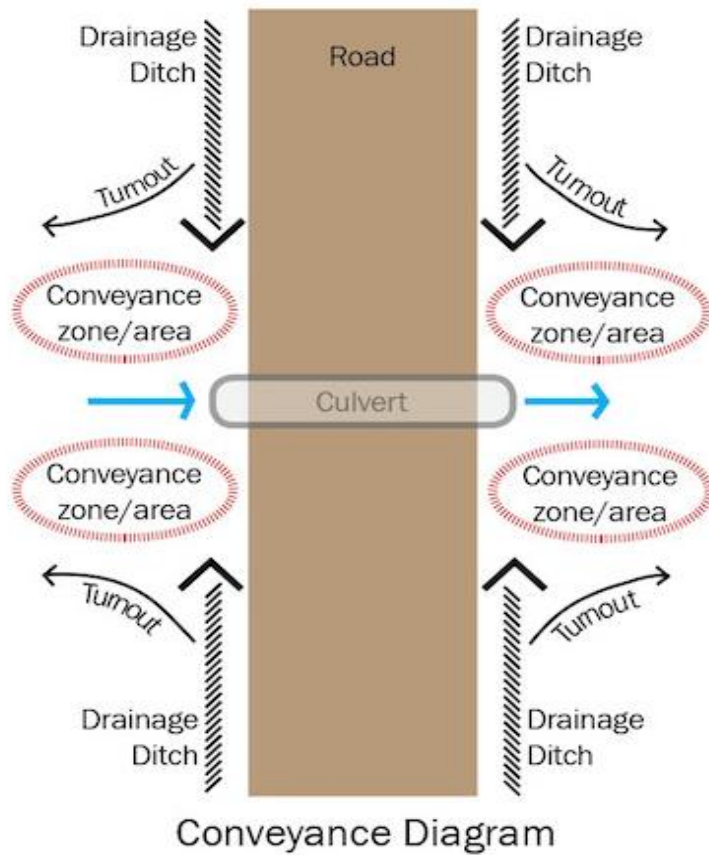


# Drainage Ditch MRGP Standards

Road Drainages	Paved	Paved/Ditched	Gravel (not Class IV)	Class IV
Sheet flow (no drainage ditch) Can be substituted for grass or stone-lined ditch. Road embankment lower than road surface (no back slope)	N/A	<ul style="list-style-type: none"> <li>Distributed flow from roadway/travel lane to grass or forested area</li> </ul>	Distributed flow from roadway/travel lane to grass or forested area	-
Drainage ditch: <u>0% ≤ Slope &lt; 5%</u>	N/A	<ul style="list-style-type: none"> <li>Grass-lined ditch</li> </ul>	<ul style="list-style-type: none"> <li>Grass-lined ditch</li> </ul>	-
Drainage ditch: <u>5% ≤ Slope &lt; 8%</u>	N/A	<ul style="list-style-type: none"> <li>Stone-lined ditch 6-8" minus minimum stone recommended <b>and/or</b></li> <li>Stone-check dams <b>and/or</b></li> <li>BMPs that disconnect water out of road drainage network (2 cross culverts or 2 turnouts per segment)</li> </ul>	<ul style="list-style-type: none"> <li>Stone-lined ditch 6-8" minus minimum stone recommended <b>and/or</b></li> <li>Stone-check dams <b>and/or</b></li> <li>BMPs that disconnect water out of road drainage network (2 cross culverts or 2 turnouts per segment minimum )</li> </ul>	-
Drainage ditches: <u>Slope ≥ 8%</u>	N/A	<ul style="list-style-type: none"> <li>Stone-lined ditch 6-8" minus stone required. 12" minus recommended for slopes &gt;10%</li> </ul>	<ul style="list-style-type: none"> <li>Stone-lined ditch 6-8" minus required. 12" minus recommended for slopes &gt;10%</li> </ul>	-



# Required Baseline Standard – Stable Turnouts



# **Required Baseline Standard – Removal of shoulder/grader berm**





# Distributed flow instead of a ditch

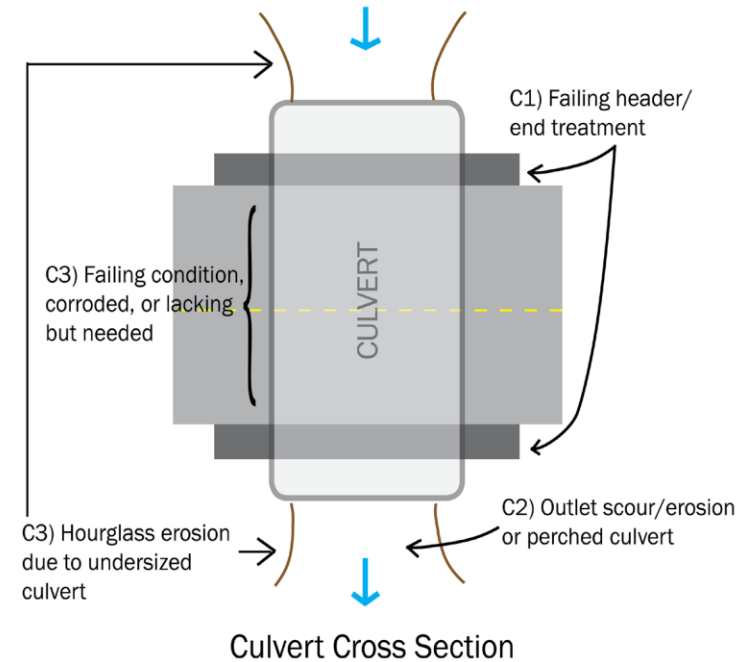


# Driveway culvert erosion and remediation (within right-of-way)





# Erosion from lack of culvert headwall/header



# Culvert outlet erosion





# Catch basin outlet erosion





# New MRGP Fees?

## Fees established through the 2015 Legislative Fee Bill

- \$2,000/annual operating fee
- \$400/application fee  
(once every permit cycle)
- \$240/Administrative processing fee  
(twice every permit cycle – major permit amendments)



# MRGP Summary for Municipalities:

- **July 31, 2018:** MRGP application coverage – Notice of Intent and annual fees begin
- **April 1, 2019:** Annual Reporting begins
- **December 31, 2020:** Road Erosion Inventories and Implementation Plans due
- **2021 Field Season** (or sooner): Road upgrades begin
- **December 31, 2025** (or sooner): All *Very High Priority* segments brought up to standards, except Class 4's
- **December 31, 2028** (or sooner): All *Very High Priority* Class 4 roads brought up to standards
- **December 31, 2036** (or sooner): all connected roads meet MRGP standards

# Assistance to Towns



- Funding – *New* Municipal Grant-in-Aid
- Outreach and Technical Assistance
- Shared Equipment

# Grant in Aid – FY18 Results and FY19 Funding

**FY 18 GIA – Actual Funding:**

- 186 participating towns – 70% participation
- \$2.6 million
- Approximately 42 road miles will be brought up to the new MRGP standards by July 1, 2018.

**FY 19 GIA – \$2.9 million (anticipated)**





# For Additional Information:

<http://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/municipal-roads-program#Development of Permit>

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